



Plains CO₂ Reduction (PCOR) Partnership Energy & Environmental Research Center (EERC)

Plains CO₂ Reduction (PCOR) Partnership Monthly Update October 1–31, 2012

PHASE III ACTIVITIES

Task 1 – Regional Characterization (Wesley D. Peck)

Highlights

- Continued the collection of data for the Pine (the south unit) and Pennel oil fields along the Cedar Creek Anticline in southeastern Montana.
- Traveled to the Billings office of the Montana Board of Oil and Gas to collect well file information on wells in the Pennel and Pine oil fields on October 2–5 and again on October 30 – November 2, 2012.
- Began plans to update the latest edition of the PCOR Partnership Atlas (Deliverable [D] 81, update due August 2013).
- Corrected data in the PETRA well database. These changes included imported formation top data for the Pine oil field and correcting township and range directions in Montana.
- Rectified storage resource numbers which surfaced in the data submitted to the National Carbon Sequestration Database and Geographic Information System (NATCARB).
- Received production data from the Nebraska Oil and Gas Conservation Commission and incorporated the information into the newly integrated data set for the U.S. portion of the PCOR Partnership region.
- Compiled a detailed PowerPoint presentation for in-house use, highlighting what is currently known about the Pine and Pennel oil fields.
- Gathered images used in the PCOR Partnership Atlas, Fourth Edition, for the Alberta Department of Energy to use in its report on the regulatory framework assessment for carbon capture and storage (CCS).
- Finalized the 2012 Annual Meeting Web page on the partners-only Decision Support System (DSS, © 2007–2012 EERC Foundation®) located at www2.undeerc.org/website/PCORP/AnnualMeetingWorkshop/2012/.

Task 2 – Public Outreach and Education (Daniel J. Daly)

Highlights

- On October 5, 2012, received notification from the conference coordinator for the 11th International Conference on Greenhouse Gas Technologies (GHGT-11) that the Regional Carbon Sequestration Partnership (RCSP) Outreach Working Group's (OWG's) "Visual Message Mapping for CCS Outreach" had been selected for Session 9D of the oral program (rather than as a poster).

- At a meeting on October 6, 2012, with Prairie Public Broadcasting (PPB), presented materials for use at the upcoming Teacher Training Institute scheduled for November 9–10, 2012, in Grand Forks, North Dakota.
- Began preparation of presentation materials for the Teacher Training Institute hosted by PPB.
- Hosted an exhibit booth featuring PCOR Partnership outreach materials on October 3–5, 2012, at the 2012 South Dakota Library Association (SDLA) Annual Meeting in Huron, South Dakota.
- Hosted an exhibit booth and distributed outreach materials at the Mountain Plains Library Association (MPLA)/Nebraska Library Association (NLA)/Nebraska School Library Association (NSLA) 2012 Tri-Conference held on October 17–19, 2012, in LaVista, Nebraska.
- Traveled to Washington, D.C., to participate in OWG focus group sessions related to the use of message maps in developing, organizing, and testing outreach materials in response to stakeholder concerns. Sessions were held on the topics of carbon capture, utilization, and storage (CCUS) and earthquakes.
- Participated in an OWG monthly conference call on October 18, 2012, and provided materials in support of the ongoing focus group activities with regard to message mapping.
- Submitted to the conference coordinator a paper for GHGT-11 entitled “Message Mapping for CCS Outreach: Testing Communications Through Focus Group Discussion,” prepared in conjunction with Sarah Wade and the OWG.
- Traveled to Regina and Estevan, Saskatchewan, Canada, with a PPB film crew on October 29 – November 1, 2012, to film activities related to the Aquistore project (installation of CO₂ soil gas samplers, water sampling, water well driving, and completion of the Aquistore well) and interviews with personnel at the Petroleum Technology Research Centre (PTRC), the International Test Center for CO₂ Capture, and the Saskatchewan Geological Survey.
- Continued preparation of a value-added video short, including a script revision and film edit, focused on smart casing installation or permanent downhole monitoring (PDM) for CCS reservoir monitoring.

Task 3 – Permitting and NEPA (National Environmental Policy Act) Compliance (Lisa S. Botnen)

Highlights

- Attended the Monitoring, Verification, and Accounting (MVA) Knowledge-Sharing Workshop on October 2, 2012, at Denbury Onshore, LLC (Denbury) headquarters in Plano, Texas.
- Continued activities associated with the Interstate Oil and Gas Compact Commission (IOGCC) Carbon Geologic Storage (CGS) Task Force, including the following:
 - Hosted a task force kickoff meeting on October 4, 2012, in Denver, Colorado.
 - Identified the operational and postoperational liability subcommittee members.
 - Distributed the meeting summary and materials to the task force members.
 - Began planning for the first subgroup meeting tentatively scheduled for November 8, 2012.

- Completed review of the Bell Creek MVA program in association with the reporting requirements under the U.S. Environmental Protection Agency Mandatory Greenhouse Gas Reporting Rule, Subpart RR – Geologic Sequestration of Carbon Dioxide.
- Attended the IOGCC 2012 Annual Meeting in San Antonio, Texas, on October 29–31, 2012. Management staff gave a presentation to the IOGCC CGS Task Force.
- With regard to the Lignite Site (Phase II) closure:
 - Continued efforts to monitor the site during the reclamation phase, including a site visit on October 18, 2012.
 - Continued to modify a draft value-added report on closure activities.

Task 4 – Site Characterization and Modeling (James A. Sorensen)

Highlights

- Various modeling staff attended Schlumberger software training entitled “Techlog Formation Evaluation Course” held October 8–12 and October 28 – November 3, 2012, in Houston, Texas.
- Modeling staff attended Schlumberger software training entitled “Petrel Property Modeling” held October 22–24, 2012, in Houston, Texas.
- Staff traveled on October 4 to visit the Bell Creek site and download information from the PDM system located on monitoring well 0506 OW in Bell Creek, Montana.
- Fort Nelson test site activities included the following:
 - Participated in a short monthly conference call with Spectra Energy (Spectra) on October 3, 2012. Topics discussed included potential path(s) forward, Spectra’s upcoming visit to the Energy & Environmental Research Center (EERC), and the order of priority for Spectra’s review of pending deliverables (including D67, D65, D19, and D41).
 - Participated in several conference calls regarding the Fort Nelson CCS Project.
 - Began wrap-up of geomechanical modeling.
 - Prepared a scope of work for the 3-D mechanical earth model.
 - Uploaded the paper for GHGT-11 entitled “Overview, Status, and Future of the Fort Nelson CCS Project” on October 12, 2012.
 - Began work on the GHGT-11 poster associated with the paper.
- Bell Creek test site activities included the following:
 - On October 1, 2012, participated in a geologic model meeting with Denbury at its headquarters in Plano, Texas.
 - On October 3, 2012, participated in a well log review meeting with Halliburton and Denbury at Denbury’s headquarters in Plano, Texas.
 - On October 3, 2012, participated in pulsed-neutron well log planning with Schlumberger and Denbury at Denbury’s headquarters in Plano, Texas.
 - Continued work on the fieldwide static geologic model, including quality assurance/quality control of the well locations, adding all Phase 9 boundaries, completing the porosity, and continuing the permeability.
 - Continued the petrophysical analysis of lithofacies and permeability.
 - Continued work on the fieldwide 3-D geomechanical model.
 - Continued work on the proposed SCAL (special core analysis) work plan.

- Continued work on the Bell Creek mineralogy assessment for characterization and modeling efforts.
- Reviewed an in-house draft mineralogy report.
- Prepared an abstract entitled “Geomechanical Modeling and In Situ Stresses Around the Wellbore, Bell Creek Field, Powder River Basin, Montana” for the 2013 American Rock Mechanics Association 47th U.S. Rock Mechanics/Geomechanics Symposium.
- Prepped samples of the U.S. Geological Survey core to send to Wagner Petrographic for thin-section preparation.
- Sent Core Labs samples from monitoring well 0506 OW to Wagner Petrographic for thin-section preparation. Two sets will be made from 48 intervals.

Task 5 – Well Drilling and Completion (John A. Hamling)

Highlights

- Uploaded the paper for GHGT-11 entitled “Overview of the Bell Creek Combined CO₂ Storage and CO₂ Enhanced Oil Recovery Project” on October 12, 2012.
- Began work on the GHGT-11 poster associated with the paper.
- Continued evaluation of a tracer flood study at Bell Creek as an MVA technique.
- Sent a formal request to Denbury to install ten soil gas profile stations at Bell Creek to supplement the MVA program and continued cost and logistics planning. The gas profile stations were installed the week of October 15–19.
- Continued planning and preparations for the November soil gas- and water-sampling event at Bell Creek.
- Continued preparation of a technical presentation about the Bell Creek surface and near-surface MVA program to be given to the PCOR Partnership Technical Advisory Board (TAB).
- Continued preparation of a mitigation plan under probable scenarios of vertical CO₂ migration.
- Continued work on a value-added preinjection surface water, groundwater, and soil gas baseline MVA sampling and analysis report including results.
- Participated in the MVA Knowledge-Sharing Workshop on October 2, 2012, and several project meetings held on October 1 and 3, 2012, in Plano, Texas.

Task 6 – Infrastructure Development (Melanie D. Jensen)

Highlights

- EERC management review continued for the interactive capture technology tree on the partners-only DSS test Web site.
- Continued study of a document from Det Norske Veritas entitled “Design and Operation of CO₂ Pipelines.”
- Gave a presentation on October 31, 2012, based on the phased approach to building a regional pipeline network report (D84), at the American Institute of Chemical Engineers (AIChE) Annual Meeting in Pittsburgh, Pennsylvania.
- Uploaded the paper for GHGT-11 entitled “A Phased Approach to Building a Hypothetical Pipeline Network for CO₂ Transport During CCUS.”
- Began work on the GHGT-11 poster associated with the paper.

- Continued the biennial update to the report entitled “Opportunities and Challenges Associated with CO₂ Compression and Transport During CCUS Activities” (D85). The first version was submitted in March 2011.

Task 7 – CO₂ Procurement (John A. Harju)

Highlights

- Participated in ongoing project discussions with Denbury.

Task 8 – Transportation and Injection Operations (Melanie D. Jensen)

Highlights

- Continued reviewing information about EOR injection site surface facilities.

Task 9 – Operational Monitoring and Modeling (Charles D. Gorecki)

Highlights

- Continued Fort Nelson site activities, including the following:
 - Uploaded the GHGT-11 paper entitled “The Role of Static and Dynamic Modeling in the Fort Nelson CCS Project” on October 12, 2012.
 - Began work on a poster for the upcoming GHGT-11.
 - Prepared a scope of work for the next stage of dynamic modeling.
- Continued Bell Creek site activities, including the following:
 - Participated in the MVA Knowledge-Sharing Workshop on October 2, 2012, and several project meetings held on October 1 and 3, 2012, in Plano, Texas.
 - Worked on the water saturation model.
 - Continued work on the simulation case with CO₂ solubility in brine.
 - Analyzed capillary rise experimental data.
 - Participated in an in-house modeling update meeting on October 18, 2012.
 - Ran predictive simulations.
 - Reviewed Bell Creek literature to find historic reservoir pressure data.

Task 10 – Site Closure (to be announced [TBA])

- This task is anticipated to be initiated in Quarter 1 – Budget Period (BP) 5, Year 9 (October 2015).

Task 11 – Postinjection Monitoring and Modeling (TBA)

- This task is anticipated to be initiated in Quarter 1 – BP5, Year 9 (October 2015).

Task 12 – Project Assessment (Katherine K. Anagnost)

Highlights

- The next assessment report is due December 31, 2012.

Task 13 – Project Management (Charles D. Gorecki)

Highlights

- Mailed 260 post-annual meeting cards to all the partners with information on how to access meeting materials on the DSS.
- Reviewed the GHGT-11 draft posters.
- Discussed the Aquistore project with PTRC personnel on October 25, 2012.
- Held a task leader meeting on October 25, 2012. Topics discussed included task leader and fund manager changes; updates on the Fort Nelson and Bell Creek projects; status of the Technical Advisory Board WebEx and winter meeting; and new hires.
- Participated in several conference calls with consultant BillyJack Consulting.
- Submitted the quarterly progress report/milestone quarterly report (D58/D59) on October 31, 2012.
- Continued planning for an interim financial closeout of the Phase II award in order to comply with the University of North Dakota's records retention policy.
- Deliverables and milestones completed in October:
 - September monthly update
 - Task 13: D58/D59 – Quarterly Progress Report/Milestone Quarterly Report
 - Task 14: M23 – Monthly Water Working Group (WWG) conference call held

Task 14 – Regional Carbon Sequestration Partnership WWG Coordination (Ryan J. Klapperich)

Highlights

- Discussed options for the newly required fact sheets (D99), including 1) water resource protection (enumerating applicable regulations), 2) MVA techniques and technologies, and 3) mitigation/remediation techniques.
- Distributed draft tables of water and CCS projects on October 9, 2012, to WWG members for review and comment by members and their colleagues.
- Distributed the notes from the September 27 conference call on October 19, 2012.
- Distributed an outline for the new water resource protection fact sheet to the WWG for review on October 22, 2012.
- Held the monthly conference call on October 25, 2012. Topics discussed included the scope of the upcoming fact sheet series and content specific to the first new fact sheet.
- Continued review of background data for the methodologies document.

Task 15 – Further Characterization of the Zama Acid Gas EOR, CO₂ Storage, and Monitoring Project (Dayanand Saini)

Highlights

- Dayanand Saini is the new task leader effective October 24, 2012.
- Uploaded the paper for GHGT-11 entitled “A Simulation Study of Simultaneous Acid Gas EOR and CO₂ Storage at Apache's Zama F Pool” on October 12, 2012.
- Began work on the GHGT-11 poster associated with the paper.
- Worked on PVT (pressure–volume–temperature) model.
- Reviewed drilling and production history.

- Worked on building static geologic model.
- Attended the Midwest Regional Carbon Sequestration Partnership (MRCSP) partners meeting held in Independence, Ohio, October 29–30, 2012.

Task 16 – Characterization of the Basal Cambrian System (Wesley D. Peck)

Highlights

- Uploaded the paper for GHGT-11 entitled “CO₂ Storage Resource Potential of the Cambro–Ordovician Saline System in the Western Interior of North America” on October 12, 2012.
- Began work on the GHGT-11 poster associated with the paper.
- Worked on adding facies to more wells (utilizing initial 61 wells).
- Discussed the maximum pressure for CO₂ injection.
- Continued work on the 3-D model of the full extent of the Cambro–Ordovician saline system.
- Prepared the 3-D model for export to Princeton University and Lawrence Berkeley National Laboratory.
- Continued geochemical modeling runs for the various horizons in several wells in order to investigate the interaction of CO₂ with the host rock.
- With regard to the Aquistore project, began planning for a trip to Calgary, Alberta, Canada, to view the core collected from the Aquistore well near Estevan, Saskatchewan, Canada.

Travel/Meetings

- October 1–3, 2012: Participated in project meetings with service providers and Denbury in Plano, Texas.
- October 2, 2012: Participated in an MVA Knowledge-Sharing Workshop hosted by Denbury in Plano, Texas.
- October 2–5, 2012: Traveled to the Montana Board of Oil and Gas Conservation to collect well data in Billings, Montana.
- October 3–5, 2012: Hosted the IOGCC CGS Task Force meeting in Denver, Colorado.
- October 3–5, 2012: Hosted an exhibit booth at the 2012 SDLA Annual Meeting in Huron, South Dakota.
- October 6, 2012: Participated in a meeting regarding upcoming teacher training institutes at PPB offices in Fargo, North Dakota.
- October 6–8, 2012: Traveled to the Bell Creek oil field to download information from the PDM system located on monitoring well 0506OW in southeastern, Montana.
- October 7–12, 2012: Remotely located staff traveled to the EERC for work plan discussions in Grand Forks, North Dakota.
- October 7–13, 2012: Modeling staff participated in Schlumberger software training entitled “Techlog Formation Evaluation Course” in Houston, Texas.
- October 8–11, 2012: Participated in focus group sessions with the OWG lead in Washington, D.C.
- October 15–19, 2012: Installed soil gas-profiling stations in the Bell Creek Field.
- October 16–19, 2012: Hosted an exhibit booth at the MPLA/NLA/NSLA 2012 Tri-Conference in LaVista, Nebraska.

- October 18, 2012: Visited the Lignite (Phase II) site near Kenmare, North Dakota.
- October 21–25, 2012: Modeling staff participated in Schlumberger software training entitled “Petrel Property Modeling” in Houston, Texas.
- October 24, 2012: Participated in meeting regarding educational materials with PPB at its offices in Fargo, North Dakota.
- October 28 – November 2, 2012: Presented at the 2012 AIChE Annual Meeting in Pittsburgh, Pennsylvania.
- October 28 – November 3, 2012: Modeling staff participated in Schlumberger software training entitled “Techlog Formation Evaluation Course” in Houston, Texas.
- October 29–30, 2012: Attended the MRCSP Partners Meeting in Independence, Ohio.
- October 29 – November 2, 2012: Participated in and presented at the IOGCC 2012 Annual Meeting in San Antonio, Texas.
- October 30 – November 2, 2012: Traveled to the Montana Board of Oil and Gas Conservation to collect well data in Billings, Montana.

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